

Section 20: Technologies

217. Were any of the following technologies in use at your establishment anytime during 1998?

	Census use only	Yes	No	Don't Know
a. Computer control of building-wide environment (e.g., space-heating equipment, cooling equipment, lights)	14010 a.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
b. Computer control of processes or major energy-using equipment (e.g., boilers, furnaces, conveyors used in the manufacturing process)	14020 b.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
c. Waste heat recovery	14030 c.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
d. Adjustable-speed motors	14040 d.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK

218. Were any of the following technologies associated with cogeneration in use at your establishment anytime during 1998?

		Yes	No	Don't Know
a. Steam turbines supplied by either conventional or fluidized bed boilers	14042 a.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
b. Conventional combustion turbines with heat recovery	14043 b.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
c. Combined-cycle combustion turbines	14044 c.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
d. Internal combustion engines with heat recovery	14045 d.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
e. Steam turbines supplied by heat recovered from high-temperature processes	14046 e.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK

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219. This establishment's six-digit North American Industry Classification System (NAICS) code is included as part of the address mailing label on the front page of this questionnaire.

If the first three digits of your establishment's NAICS code are:

- "322" (paper industries), then go to question 220, this page.
or "325" (chemical industries), then go to question 221, page 50.

If the six-digit NAICS code of your establishment is:

"331111" (iron and steel mills), then go to question 223, page 52.

For all other NAICS codes, go to question 224, Section 21, page 55.

Question 220: For Paper Industries (NAICS Code 322) Only

220. Were any of the following technologies associated with paper industries in use at your establishment anytime during 1998?

Census
use only

Yes

No

Don't
Know

a. Continuous digesters

14360 a.

19 Yes

29 No

39 DK

b. Displacement bleaching process

14370 b.

19 Yes

29 No

39 DK

c. Top-wire (hybrid) paper forming

14380 c.

19 Yes

29 No

39 DK

d. Extended nip press

14390 d.

19 Yes

29 No

39 DK

e. Higher nip pressures

14400 e.

19 Yes

29 No

39 DK

f. Extended delignification

14890 f.

19 Yes

29 No

39 DK

g. Rapid displacement batch heating processes

14900 g.

19 Yes

29 No

39 DK

h. Multi-effect falling-film evaporators for black liquor evaporation and concentration

14420 h.

19 Yes

29 No

39 DK

Continue question on next page

Section 20: Technologies, cont.

Question 220: For Paper Industries (NAICS Code 322) Only, cont.

	Census use only	Yes	No	Don't Know
i. Vapor recompression evaporation of black liquor	14430 i.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
j. Waste-heat recovery technologies in lime kilns	14440 j.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
k. High solids firing (black liquor)	14910 k.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
l. Gas infrared radiant drying systems	14920 l.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK

Go to question 224, Section 21, page 55

Questions 221 and 222: For Chemical Industries (NAICS Code 325) Only

221.	Were any of the following technologies associated with chemical industries in use at your establishment anytime during 1998?	Census use only	Yes	No	Don't Know
a.	Replacement of electrically heated platens in the thermoset molding process with a gas-fired central thermal fluid system	14460 a.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
b.	Processing residuals as alternative feedstocks	14470 b.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
c.	Biomass materials (e.g., lignocellulosics, food crops, food wastes) used as alternative feedstocks	14480 c.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
d.	Bioprocessing of petroleum, natural gas, coal, or other fossil-based feedstocks	14490 d.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK

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Question 222: For Chemical Industries (NAICS Code 325) Only, cont.

222. Were any of the following technologies in use at your establishment anytime during 1998?

These technologies are innovative processing and separations that (1) substitute use of fossil-based feedstocks with biomass materials, (2) increase overall process efficiency, or (3) reduce environmental impacts and waste processing.

	Census use only	Yes	No	Don't Know
a. Direct microbial	14500 a.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
b. Bioprocessing	14510 b.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
c. Gasification of biomass feedstocks	14520 c.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
d. Fast pyrolysis of biomass feedstocks	14530 d.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
e. Immobilized enzyme processes	14540 e.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
f. Innovative catalytic processes	14550 f.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
g. Recycling of materials	14560 g.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
h. Hydrolysis of biomass materials	14570 h.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
i. Enhanced bioprocessing with genetically engineered feedstocks or organisms	14580 i.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
j. Fermentation	14590 j.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK

Question continued on next page

Section 20: Technologies, cont.

Question 222: For Chemical Industries (NAICS Code 325) Only, cont.

	Census use only	Yes	No	Don't Know
k. Fractionation of biomass	14600 k.	19 Yes	29 No	39 DK
l. Distillation process improvements	14610 l.	19 Yes	29 No	39 DK
m. Hydrocarbon cracking enhancements	14620 m.	19 Yes	29 No	39 DK

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Question 223: For Iron & Steel Mills (NAICS Code 331111) Only

223. Were any of the following technologies associated with iron and steel mills in use at your establishment anytime during 1998?	Census use only	Yes	No	Don't Know
a. Dry quenching during the coking process	14630 a.	19 Yes	29 No	39 DK
b. External desulfurization of the charge for ironmaking	14640 b.	19 Yes	29 No	39 DK
c. Hydrocarbon injection to maintain blast furnace temperatures	14650 c.	19 Yes	29 No	39 DK
d. Direct reduction ironmaking--sponge iron produced directly from iron ore	14660 d.	19 Yes	29 No	39 DK
e. Continuous casting	14670 e.	19 Yes	29 No	39 DK
f. Thin slab/strip casting	14680 f.	19 Yes	29 No	39 DK

Question continued on next page

Section 20: Technologies, cont.

Question 223: For Iron & Steel Mills (NAICS Code 331111) Only, cont.

	Census use only	Yes	No	Don't Know
g. Waste heat boilers/heat exchangers in combination with reheat furnaces	14690 g.	<input type="radio"/> 1 Yes	<input type="radio"/> 2 No	<input type="radio"/> 3 DK
h. Evaporative cooling of skid rails	14700 h.	<input type="radio"/> 1 Yes	<input type="radio"/> 2 No	<input type="radio"/> 3 DK
i. Electric induction reheat furnaces	14710 i.	<input type="radio"/> 1 Yes	<input type="radio"/> 2 No	<input type="radio"/> 3 DK
j. Hot charging--moving steel directly from the caster to the reheat furnace	14720 j.	<input type="radio"/> 1 Yes	<input type="radio"/> 2 No	<input type="radio"/> 3 DK
k. Direct rolling required no reheating	14730 k.	<input type="radio"/> 1 Yes	<input type="radio"/> 2 No	<input type="radio"/> 3 DK
l. Plasmasmelt smelting of partially reduced iron powder with pulverized coal	14740 l.	<input type="radio"/> 1 Yes	<input type="radio"/> 2 No	<input type="radio"/> 3 DK
m. Cold bonding (COBO) pelletizing technique	14750 m.	<input type="radio"/> 1 Yes	<input type="radio"/> 2 No	<input type="radio"/> 3 DK
n. Preheating combustion air	14760 n.	<input type="radio"/> 1 Yes	<input type="radio"/> 2 No	<input type="radio"/> 3 DK
o. Preheating raw materials	14770 o.	<input type="radio"/> 1 Yes	<input type="radio"/> 2 No	<input type="radio"/> 3 DK
p. Top gas pressure recovery from the blast furnace	14780 p.	<input type="radio"/> 1 Yes	<input type="radio"/> 2 No	<input type="radio"/> 3 DK
q. Slab heat recovery	14790 q.	<input type="radio"/> 1 Yes	<input type="radio"/> 2 No	<input type="radio"/> 3 DK

Question continued on next page

Section 20: Technologies, cont.

Question 223: For Iron & Steel Mills (NAICS Code 331111) Only, cont.

	Census use only	Yes	No	Don't Know
r. Continuous annealing	14800 r.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
s. Continuous cold rolling	14810 s.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
t. Bottom tap vessels	14820 t.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
u. Injection steel making	14830 u.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
v. Electroslag or vacuum arc remelting	14930 v.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
w. Oxygen or coal injection to blast furnace	14940 w.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
x. Steel ladle metallurgy with reheat furnace	14880 x.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK
y. Oxy-fuel firing	14950 y.	<input type="text" value="19"/> Yes	<input type="text" value="29"/> No	<input type="text" value="39"/> DK

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Section 21: Establishment Size

224. How many buildings were on this establishment site as of December 31, 1998?

Census
use only
17010

Number of Buildings

Buildings include:

- 1) structures enclosed by walls extending from the foundation to the roof,
- 2) parking garages, even if not totally enclosed by walls and a roof, or
- 3) structures erected on pillars to elevate the first fully enclosed level.

17020

1 9 Don't Know

Excluded as buildings are:

- 1) structures (other than the exceptions noted above) that are not totally enclosed by walls and a roof,
- 2) mobile homes and trailers, even if they house manufacturing activity,
- 3) structures not ordinarily intended to be entered by humans, such as storage tanks, or
- 4) nonbuildings that consume energy (such as pumps and construction sites).

225. What was the approximate total enclosed square footage of the buildings located on this establishment site as of December 31, 1998?

13010

Total Square Feet

Include in this estimate all the area enclosed by the exterior walls of a building, such as indoor parking facilities, basements, hallways, lobbies, stairways, and elevator shafts.

13011

1 9 Don't Know

Section 22: Remarks

226. Please use this space for any explanations that may be essential in understanding your reported data. If additional space is needed, attach a separate sheet, including the 11-digit Census File Number (CFN) located on the mailing label on the front of this questionnaire.

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Section 23: Contact Information

227. Name of person to contact regarding this questionnaire *(Please print or type)* Date

228. Title of contact person above *(Please print or type)*

229. Telephone: Area Code Number Extension
 -

230. Address--Number and Street

231. City State ZIP Code (9 digits)

232. Internet or E-mail address, if available *(Please print or type)*

19010

Thank you for completing this questionnaire!

Please photocopy this questionnaire for your records.

**Return this questionnaire in the return envelope provided.
If the envelope has been misplaced, return the completed questionnaire to:**

**Bureau of the Census
1201 East 10th Street
Jeffersonville, IN 47132-0001**